VOL. III. NO. 1.

NOVEMBER, 1887.

THE EXCHANGERS' MONTHLY

Price, 3 cents. 25 cents a year.

DEVOTED TO

Mineralogy, Geology, and Archæology.

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Published by **THOS. CHAMBERLAIN, JR.,** *Jersey City, N. J.*

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[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. III. JERSEY CITY, N. J., NOVEMBER, 1887. NO. 1.

CRYSTALLOGRAPHY.

By T. J. Lewis.

PART I.

For the benefit of the young student it will be best to start this subject with a brief description of terms used.

All crystals are assumed to have an imaginary line through them connecting opposite planes, angles or edges, termed "axes;" and by the relative position and length of these axes the system to which a crystal belongs is determined.

"Solid angles" are the points at which three or more faces meet.

When two faces having the same angle to the axes meet, the point of intersection is termed an "edge;" but where the angles of the faces are different, the resulting edge is a "combination edge."

When an edge is replaced by a face at equal angles to the adjoining faces, it is said to be "truncated;" but when replaced by two faces, then the edge is "beveled."

In crystallography there are six systems. The first and most widely dispersed is the Isometric System, which has three axes, all of equal length and at right angles to each other. Any one of them can be the vertical axis. The most striking and at the same time most common example of this system is the cube, which is found in pyrite, galenite and fluorite.

By truncating the solid angles of the cube, we get the first modification. By continuing the new faces thus formed until the corners intersect, we have the cubo-octahedron, a figure bounded by six equal squares and eight equilateral triangles. By still further cutting we finally remove all the faces of the cube, and the octahedron results, a figure of eight equilateral triangles, the truncation of whose solid angles would again develop the cube. The axes of the octahedron connect the solid angles instead of the faces, as in the cube. Example: pyrite, magnetite, franklinite and spinel.

Again, taking the cube and truncating the edges, of which there are twelve, we form the dodecahedron, a figure having twelve diamond-shaped faces and having two kinds of solid angles, the "trihedral," made up of three faces intersecting, and the "tetrahedral," which is the intersection of four faces and the axial termination.

The dodecahedron is the common form of garnet and zincblende.

The edges of the trigonal trisoctahedron have the same angles as the octahedron. The form is different only in having what would be the octahedral faces replaced by a low three-sided pyramid, thus giving it twenty-four instead of eight faces. Example: a rare form of magnetite.

The tetragonal trisoctahedron has also twenty-four faces, each face being a quadrilateral. This form has three kinds of solid angles which take their name from the form that would result if they were removed. Six cubic, eight octahedral, and twelve dodecahedral solid angles. Example: garnet.

Tetrahexahedron.—One of the forms under this name is a cube the edges of which have been replaced by bevelment, thus making two faces to each edge and giving with the cubic faces thirty faces in all. More properly speaking this is a combination of the tetrahexahedron with the cube. Continuing the bevelment previously mentioned until the face of the cube is entirely removed, the regular tetrahexahedron is formed.

This form would be better understood by imagining a low four-sided pyramid to be planted on the faces of a cube

Hexoctahedron.—A figure of forty-eight faces, each face being a scalene triangle.

This form is really a dodecahedron with a four-sided pyramid substituted for each of its plane faces. One variety of crystal of amalgam and also of magnetite is a peculiar combination of the angles of nearly all the preceding forms.

The tetrahedron is entirely different from any of the above forms and is a solid bounded by four equilateral triangles and forming a three-sided pyramid. Take a piece of cardboard and cut out four equilateral triangles. Fasten them in pairs at the base. Then reverse one pair and fasten the points at the ends of the base of the other pair, so that the edges will be at right angles and the tetrahedron results. This form can be developed by truncating four diagonally opposite corners or solid angles of the cube, two above and two below, until the new faces join and form a double wedge with edges at right angles. Example: chalcopyrite and tetrahedrite.

By elevating the center of all the faces of the tetrahedron until the plane surface is replaced by a three-sided pyramid, we get the hemitrisoctahedron, so called on account of having one-half the number of faces of the trigonal trisoctahedron. Other modifications of the tetrahedron connect it hemihedrally with all the preceding forms.

The pentagonal dodecahedron has twelve faces, each face having five edges, and is usually called a pyritohedron from its frequent occurrence as a form of pyrite.

These modifications are merely used to connect the forms as found in nature, as it must not be thought that one figure is formed and then converted into another.

[TO BE CONTINUED.]

A VISIT TO THE LEAD MINES AT NEW GALENA.

By Aron Hamburger.

A short time ago a party of enthusiastic students of mineralogy and geology living in North Wales, Pa., planned a visit to the lead deposits of New Galena, Bucks. Co., Pa. In fact this visit was contemplated by them for a long while. We hired a horse, light carriage and driver, and we were soon on our way. The roads were very rough and crooked, and on this account the distance seemed twice as far as it really was. We met some Pennsylvania Dutchmen of whom we inquired the road and distance to New Galena. They told us one and a half miles. We then rode about two miles farther when we saw another man who told us that it was two miles farther on. When we came to the guide-posts they said "Two and a half miles to New Galena." We were very much disgusted and with one accord christened it "The Two Mile Country."

When at last we arrived at the mines, we obtained permission to visit them and to take as many specimens of the mineral as we wished. There are four veins of lead on this property and one of copper. The principal ore of these mines is galenite, sulphuret of lead, PbS. Many granular and cubical specimens were found. The ore is of an excellent quality. We also obtained specimens of chalcopyrite, a claylike substance containing lead, oxide of lead, and had presented to us a fine large specimen of argentiferous or silver-bearing lead, Pbs + Ag, by the wife of the overseer of the place. What seemed remarkable to us was the fact that no other minerals are found in any quantity.

MINERALS AT THE AMERICAN EXHIBITION, LONDON.

One of the most conspicuous features of the American Exhibition is the remarkable collection of minerals brought over and exhibited by a well-known American dealer.

The central feature is a hexagonal pavilion covered with mica, and surmounted by a model of a snow crystal. Each side of the pavilion is devoted to a separate mineral region of the North American continent, except the first, which is filled with a collection of gems and ornamental stones. Here are rough and cut specimens of a precious ruby, topaz, opal, williamsite, with examples of malachite and azurite beautifully banded and taking a fine polish.

A lapidary who has had several years' experience in making rock sections for the British Museum is constantly employed close by.

Minerals from the region near the Pacific coast come next. Wulfenite, a rare species, some of the finest specimens ever seen, is here exhibited in large groups of orange-red crystals; also brilliantly red vanadinites and large bright crystals of chessylite or azurite associated with velvet tufts of malachite. All these are from the marvelous country that Humboldt called New Spain. The deep red garnets from Alaska in their somber settings of gray mica-schist are especially noteworthy. Among the minerals of the Rocky Mountain region are wonderful crystals of the green Amazon stone, ore from the famous Bridal Chamber at Lake Valley, New Mexico, so rich that the heat of a match will cause it to melt and fall in drops of nearly pure silver. A space the size of a moderate sized room produced $485,000. The precious turquoise comes from Los Cerillos, New Mexico, where Montezuma got his chalchuhuitls that he valued above gold and silver. The Indians still make long pilgrimages for the sacred stone.

Most striking among the minerals of the Mississippi Valley and lake region are the blendes and galenas from Southwest Missouri, a district that now produces over one half of all the zinc mined in the world. It was formerly so abundant that farmers built fences with it. Masses of the lead ore weighing ten tons were found within 12 ft. of the surface. Here Indians formerly procured the lead for their bullets, placing the ore in hollow stumps and building a fire over it.

From Arkansas come fine rock crystals or hot spring diamonds, with powerful lodestones, arkansites, and hydrotitanites.

From the Lake Superior region come copper, chlorastrolites, and zonochlorite, a remarkable gem-like mineral.

In the case devoted to the North Atlantic coast region is rhodonite, so much used by the Russians in their ornamental work, in fine crystals. The mines at Franklin, N. J., produces also many minerals found nowhere else in the world, **such as franklinite**, anomolite, a new species recently described by Prof. G. A. Konig, of the University of Pennsylvania; troostite, jeffersonite, blood-red zincite, etc. Cacoclasite, a new species in fine crystals, associated with pink titanite, comes from the same region, as do the remarkable crystals of apatite. These are among the finest specimens ever seen, and associated with them are the brilliant twin zircons. From the apatite are manufactured hypophosphites to stimulate the appetite and superphosphates to grow wheat and corn.

The last case, devoted to the South Atlantic coast region, contains amethysts, sapphires, aquamarines, tantalite, gummite, and uranolite, huge sheets of mica, etc.

Next to the wall opposite, is a very extensive collection illustrating the mineralogy of Pennsylvania, which, besides the well-known coal, iron, and other ores that have made the States famous, includes very extraordinary specimens of the rare mineral brucite, from which the medicine Epsom salts may be made; diaspore in fine crystals, corundum for polishing purposes, chromite for producing brilliant yellows, etc.

Adjoining, in cases and drawers, are the college and educational collections, indispensable for the studies of mineralogy, geology, and chemistry.

There are also on exhibition collections from Kansas and other States.

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THIS number begins our third year and we hope it will be found as interesting as its predecessors. Our only regret is that time will not permit us to increase its size, but think that as much interesting reading will be found in it as in some amateur publications of double its size. We hope that our subscribers will continue to contribute to its columns such articles as they think will be of interest to our readers, and also try to induce their friends to subscribe.

ONE of our subscribers writes that he would like to see an article in the columns of THE EXCHANGERS' MONTHLY on the Preparation of Microscopic Slides. He states that he has never seen an article on this subject in any amateur paper. We beg leave to state that we have already published an article on this subject in No. 11, Vol. I, of THE EXCHANGERS' MONTHLY, by the well-known mineralogist, Thos. S. Ash, and it was extensively copied in other publications. We will publish another article on this subject if any of our subscribers will kindly send us one. Now that the collecting season is about over we shall expect a number of interesting articles about these trips.

Celestine in Nautilus Aratus.

By W. STAHL.

THE author has determined the composition of crystals found in the inner layer of the fossil Nautilus aratus from the Jura, near Rosswangen. The analysis yielded: So_3 43.93, BaO 3.65, SrO 49.30, CaO 2.80. Corresponding to the formulæ: $BaCa_2 Sr_{20} (So_4)_{23}$; the specific gravity of the crystals was 3.91.

AT a recent meeting of the Colorado Scientific School, various new occurrences of minerals have been described. Mr. W. B. Smith mentions the rare mineral Dioptase from a new locality near Riverside, Pinal Co., Arizona; it is found in well-formed prismatic crystals, the largest 3.5 mm. in length and 0.5 mm. in thickness. He also notes Alabandite in crystals on Snake River, Summit Co.; Manganite on Devil's Head Mountain, Douglass Co.; a black ferriferous rutile from near St. Peter's Dome, in Pike's Peak region; Epidote and Garnets and a Corundum Schist from Chaffee County. Mr. R. M. Pearce describes the occurrence of Enargite at the Gangon Mine, Montana; Erinite and other copper arsenates, also Pharmacosiderite, from the Tentic District, Utah.

WASH ivory well in soap and water, with a small brush to clean the carvings, and place while wet in full sunshine. Wet for two or three days several times a day with soapy water, still keeping it in the sun with a glass shade over; then wash again and it will be beautifully white.

GOLD DISCOVERY IN QUEBEC.—A deposit of gold yielding at the rate of $800 a ton has been discovered in Buckingham Township, Quebec. It is now fifteen feet deep and promises to do better a little lower.

THE rare mineral Langite has been found by Von Foullon forming the cement of a breccia in Pockwerke, Garnstein.

DIAMONDS.

By A. K. Bates.

The diamond is the most costly, most brilliant, and least perishable among all precious gems. Though the ancients esteemed the diamond, yet highly-colored rubies, and even emeralds and sapphires, were often taken in preference.

The reason for this lay in the hardness of the stone, which the Greeks called the unsubduable. They fabled that when struck with a hammer it would shatter both hammer and anvil. It was not till about A. D. 1456 that Berghem discovered the secret of cutting and polishing diamonds, and so helped to advance them to the first rank among gems.

The discovery, that by rubbing two diamonds to each other, their surfaces were polished, and facets were formed, led to the use of diamond dust and the polishing wheel.

Where there were flaws, or the artistic pattern required the removal of large pieces of value, they were occasionally split by a blow of the hammer and chisel, in the line of natural cleavage; but as the diamond is very brittle, many rare gems were thus destroyed.

When the proper shape was obtained, the facets were polished on a wheel. This process demands skill and much labor, and the diamond cutter always got poor pay.

By the hand process, several months of steady toil were required to reduce a diamond of thirty carats to its finished form. In the case of large diamonds several years were needed.

A series of wheels kept some circular plates continually revolving, and these were coated with dust.

The stone to be polished being fastened to the end of a piece of wood was ground by the friction of hard substances.

The supply of diamonds has come from scattered districts of the world. India was the first, and for a long period the most famous source.

Certain tribes searched for them in beds of clay, but the amount of toil required never gave the workmen more than a scanty livelihood.

The Borneo mines came to notice soon after the India mines failed. The greatest find was a diamond weighing 367 carats, of the purest or first water, and uncut is worn by the Rajah of Mattau.

The Brazilian diamonds came to light through finding them used by the negroes as counters in playing cards. The mines were appropriated as government property, and worked for many years by gangs of overseers. The largest Brazilian diamond found weighed 254½ carats, but they only averaged one carat and seldom exceeded twenty.

About twelve or fifteen years ago the South African fields came in play and attracted thousands of adventurers. The total yield of this field is estimated to be seventy-five million dollars. The largest weighed about 288 carats.

A few diamonds have been discovered in California, Mexico, and other places, but of of an inferior character.

In its native form the diamond always occurs in crystals of from eight to forty-eight facets.

Utilizing Petrified Wood.

The petrified wood that is so abundant in the United States Territories of Arizona and Wyoming and the Rocky Mountain regions, is rapidly becoming utilized. In San Francisco there is now a factory for cutting and polishing these petrifications into mantel pieces, tiles, tablets, and other architectural parts for which marble or slate is commonly used. Petrified wood takes a finer polish than marble or onyx, the latter of which it is driving from the market. The raw material employed comes mostly from the forests of petrified wood along the line of the Atlantic and Pacific Railway. Several other companies have also been formed to obtain concessions of different portions of these forests. Geologists will regret the destruction of such interesting primeval remains, and some steps ought to be taken to preserve certain tracts in their original state.

NEW YORK MINERALOGICAL CLUB.

THE thirteenth meeting of this Club was held, on invitation of Prof. J. J. Stevenson, at the University of New York, Washington Square, on Tuesday, Sept, 27, at 8 o'clock.

Prof. Stevenson exhibited a number of fine specimens, together with five samples of crude petroleum, and gave an interesting account of the different petroleum wells in this country and Russia, and also of the natural gas as used at Pittsburgh, Pa.

Mr. Simmons exhibited some fine Colemanite and Selenite crystals.

Mr. Quintard showed some fine chondrodite and brucite crystals.

Mr. Kunz gave some interesting particulars about the late meteorite which fell in the Bay of Fundy.

It was decided, hereafter, to devote each evening to one particular mineral or group of minerals, and a committee of five, Messrs. B. B. Chamberlain, E. A. Hutchins, J. S. Spencer, William Niven, and Geo. F. Kunz, was selected to pass on papers to be read at the meetings.

The subject of our next meeting will be inclusions in quartz.

After the admission of some new members and partaking of some refreshments, the meeting adjourned.

◆

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◆

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VOL. II. NO. 2.

DECEMBER, 1887.

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Published by **THOS. CHAMBERLAIN, JR.,** Jersey City, N. J.

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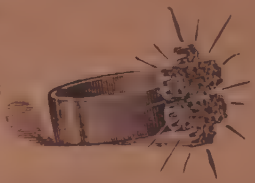

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THE EXCHANGERS' MONTHLY

[Entered at the Post Office of Jersey City, N. J., as Second Class Matter.]

VOL. III. JERSEY CITY, N. J., DECEMBER, 1887. NO. 2.

CRYSTALLOGRAPHY.

By T. J. Lewis.

PART II.

Tetragonal.—This system, like the isometric, has three axes all at right angles, but differing in having the vertical axis either longer or shorter than the two lateral axes, which are equal. Thus but one axis can be the vertical, and a plane at right angles to it is termed the basal plane.

The planes parallel to the vertical axis, and there are four such planes, form the square prism.

This system follows so closely in the modifications and combinations of the square prism to the modifications of the cube in the isometric system, that further description is unnecessary, merely advising care to note the length of the vertical axis.

Hexagonal.--In this system there is three lateral axes of equal length, and one vertical axis which may be any length and at right angles to the laterals. The lateral axes intersect each other at angles of sixty degrees.

The hexagonal prism is a solid bounded by six faces parallel to the vertical axes, and may be a basal plane or pyramid. A good example of this form can be found in apatite, pyramorphite, and many other minerals which crystallize with both the pyramid and basal plane.

A quartzoid is two hexagonal or six-sided pyramids connected at their bases and having twelve faces. This form is one of the common forms of quartz, from which it takes its name.

A berylloid is somewhat similar to the quartzoid, but having twenty-four faces.

The rhombohedron is the common form of calcite and many of the carbonates, both in cleaving and crystallization. Where the connecting line occurs between the rhomb and the hexagonal system, it will no doubt puzzle many a young collector, but by following the directions he will better understand it.

Take any crystal of quartz, though a quartzoid would be the best. Paste on one face a piece of stiff paper reaching the apex and projecting below the basal edge and over the sides. Now on the alternating face paste another piece and push it up to the apex and against the first piece, and so with the next alternating face. Thus the paper will be on three sides and projecting over the other three sides. Trim off the surplus paper and the result is a three-sided pyramid corresponding to the obtuse solid angles of the rhomb. Another way would be to get a perfect rhomb, and taking the obtuse solid angle for the apex, grind off the acute solid angles and a quartzoid will result. This plan would take more time but would give better results.

Orthorhombic.--In this system the three axes are at right angles, but all unequal in length, and touches in its forms the modifications of the cube and square form. Sulphur, celestite, barite, etc., are good examples.

Monoclinic.—This system has also three axes of unequal length, two at right angles, but the third is oblique. As a description without illustration would not convey a good idea of the forms of this system, an example can be had in orthoclase and pyroxene, two common minerals crystallizing in this system.

Triclinic.—In this system the three axes are all unequal and mutually oblique. Example, oligoclase, axinite, albite.

[THE END.]

COLLECTING.

By Aron Hamburger.

From time immemorial the young people of all nations have gathered together a miscellany of shells, bright pebbles, curiosities from various lands, birds' eggs—in fact every form of curiosity was represented in these collections.

These and other objects of art and nature were collected in an aimless sort of way, without giving the least benefit to their collectors, as in most cases they were looked at perhaps once or twice, and then thrown in some corner or given away.

We now observe quite a change in collecting. As a general thing collectors now try to learn every known fact about their specimens, and are much benefited by the knowledge they have thus gained. On the other hand we find many boys and girls collecting such entirely useless objects as postmarks, when their time could be profitably employed in collecting and studying specimens from the various kingdoms of nature. Many people ridicule the collection of foreign used stamps as "an unprofitable craze," but even this is not without its use as it is an excellent means of keeping a boy to his geography.

We by no means wish to insinuate that only boys are interested in Philately, as we learn that the Prince of Wales and Baron Rothschild are both enthusiastic collectors.

That which is a waste of time and money is the disease called "the craze." The craze in time will go to make way for more scientific collecting—collecting which is prolific in knowledge.

The young collector would find it more to his interests to select a branch in Natural History from which to form his collection, than to change his craze about once every month.

When collecting minerals it is far more interesting and instructive to visit the various railroad cuts and quarries, and select our specimens for ourselves. Mineralogy and geology learned in this way is very fascinating.

This method of study is far preferable to sending a distance for specimens which we might find for ourselves if we searched our own neighborhood. It is all well enough to send to Mexico for specimens if your cabinet contains all the species from your own locality.

Of all things don't get a craze. It will cost more money and time than it is worth, and then will do no good. As we have before said, take up some study—it matters little what it is as long as it is instructive—collect as many specimens as possible illustrative of the chosen subject, and study each attentively and you will find yourself much the richer in knowledge.

Movement of Glaciers.

The cause of the movement of glaciers is still to some extent a disputed question. It was formerly claimed by some that ice is of a viscous nature, like tar, and flows under the influence of gravitation, like any similar substance; but experiments have shown that, while ice can be bent in any direction, it cannot be drawn out, but always breaks when pulled apart. So, when a glacier falls over a cliff, it does not flow smoothly over, but is broken up into separate fragments, which reunite again on reaching a more level part of the valley. It is probable that the motion of a glazier is due to the principle of regelation.

SUPERSTITIONS OF GEMS.

The superstitions that still linger round gems and precious stones represent a rapidly diminishing quantity. We no longer attribute, as our forefathers did, to each stone a special influence over each month, nor wear the sapphire in April, the agate in May, and so forth. We never think of appropriating to twelve kinds of precious stones the twelve signs of the zodiac or the twelve Apostles; and if there was any pious intent in making the chrysolite the symbol of St. Matthew, the jasper of St. Peter, or the uncertain beryl of the incredulous St. Thomas, we deem ourselves exempt from the need of such reminders. Surely it was no mean happiness to possess gems which, like the sapphire, insured the fulfilment of prayer, or, like the diamond and amethyst, reduced war to a safe and pleasant pastime. And anyone who has known the agitations of a lawsuit might well think that the nervous reliance he placed in his solicitor would not have been badly exchanged for the faith which in an earlier age and a similar plight he would have placed in a morsel of chalcedony.

Like botany, astronomy, or even theology, mineralogy had its roots and beginnings in the superstitions and searchings of magic; and perhaps, indeed, without superstition to foster observation, science of any kind would never have come to life at all. But be this as it may, so embedded in superstition is the older mythology, that notwithstanding the intrinsic beauty of the precious stones it may fairly be suspected that their original attraction lay less in their beauty than in their anticipated efficacy for magical and medicinal purposes. To this day the agates, garnets, heliotrope, serpentine, that are so frequently found in the Tyrol mountains, are chiefly valued for their magical uses; the agate, for instance, rendering its wearer proof against serpent-bites, or making him a good speaker, whilst the emerald strengthens his sight and memory; and drinking-cups of serpentine are a security against poison. Take first the diamond, the king of stones. Besides its minor properties of averting bad dreams, insanity, and poison—all of them common dangers to royalty—it has the higher virtue of rendering its possessor invincible in war and of repelling his enemies; and as a war has from time immemorial been the fashionable occupation of kings and nobles, the magical qualities of the diamond would alone suffice to give it the rank among gems that it still enjoys.

Till the seventeenth century at least this aspect of gems constituted the chief interest of mineralogy. Marbodius is full of such things as the power of the chrysolite to drive away evil spirits, of the onyx to dispel sadness, of the heliotrope to confer the gift of prophecy, of the coral to avert storms and thunderbolts from the fields, or houses, or ships. All these qualities go back, doubtless, to the remotest days of Paganism, for they correspond in character with those attributed to precious stones in the oldest extant poem on the subject, written by Onomakritus, a Greek priest of the fifth century before Christ, and by him ascribed to Orpheus. One can understand that next or equal in importance to the value of a stone as a pledge of victory in battle, would rank its capacity to insure to its possessor the fulfilment of his prayers addressed to the immortal gods, and this is what stands out in that work as their chief interest and purport. The supreme merit of the adamas, the crystal, the tree-agate, the jasper, the topaz, and the opal is that the gods are impotent to resist the spell of their influence. Only let a man go to the temple with a crystal in his hand, and none of the immortals will refuse to hear his prayer. Nothing is so conservative as superstition, or so little liable to freaks and fluctuations, and therefore it is strange that the sapphire, which, in addition to its power of obtaining an answer to prayer, and also the faculty of protecting its owner from fraud, fear, or envy, should have come in modern superstition to hold the position of an unlucky stone. There are numbers of foolish people nowadays who will actually refuse the gift of an opal or sell any they may possess rather than be the owner of so dangerous a source of bad luck and dispelled affection.

THE
Exchangers' Monthly.

PUBLISHED BY
Thos. Chamberlain, Jr.

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THOS. CHAMBERLAIN, JR.,
284 PAVONIA AVE., JERSEY CITY, N. J.

THE SILVER MOLECULE.—In an exhaustive paper upon methods of measuring thin films. Otto Wiener makes certain measures of the thickness of a film of silver which can just be perceived by the eye, and arrives at the conclusion that 0.2 millionths of a millimeter is an upper limit of the diameter of a silver molecule.

ARIZONA'S RICH GOLD MINE.—Private advices from Prescott, A. T., dated Nov. 15, report that the gold mine discovered ten miles from there on the Hassayampa River, is richer by far than anything ever discovered in the world. The ore averages $1000 per ton, and thousands of tons are in sight. Two men with a common mortar pounded out $800 in less than one hour. The gold clings to the rock in the purest scales. A man with a knife can scale a handful in a few minutes. There is every indication of the ledge containing fabulous quantities of the precious metal.

AT the Exposition at Kansas City, Mr. David H. Todd has several cases of fossil remains that are much coveted by geologists and antiquarians. It is a large collection for a private one, and of considerable interest to Kansas City people, as many of the specimens were found in and around that city. They consist of ferns, leaves, nuts, insects, worms, and shells. The nautilus ponderasus is one of the largest and most perfect specimens.

There are a dozen or more geodes from Keokuk, Ia., corals from the Gulf of Mexico, starfish from California, and beautiful colored salt crystals from the salt vats of Saline, N. Y. There are curious and interesting specimens of the algæ and crustaceans of the tertiary or first period of life on earth, many of the fossil shells being identical with those of the present day. There are strange fossils of the Devonian age and fishes of the Silurian age. He has also a superb collection of fossil ferns.

How Pearls are Caught.

A GREAT many of the inhabitants of the Bahamas get their living by fishing, especially for pearls. They go out in small boats to where the water is about twenty feet deep, when by the use of the water-glass, they can easily see any object at the bottom. This glass consists of four boards about fifteen inches long, nailed together in the form of a hollow pyramid ; the small end is closed with a piece of glass. By putting this end a few inches below the surface of the water and looking in the other, they can discern any object at a considerable depth. As soon as they see a conch they dive for it, and never fail to bring it up.

After having collected a number of shells they are taken to the shore and the conch is examined for its pearl. They can usually tell by feeling, but to make sure they cut them up, when, if the conch contains a pearl, it will drop out as soon as the flesh is opened. The pearl is simply a hard formation inside of the flesh of the conch, and has no apparent connection with it. It is rarely that one is found. Often hundreds of conchs are caught without finding a single pearl, while two or three may be found in a catch of half a dozen conchs. The fishermen easily get from $5 to $100 apiece for them.

WEBB'S HILL, YORK COUNTY, PA.

By Jas. W. Shettel.

A welcome shower had fallen in the morning changing the almost torrid heat to a cool and invigorating temperature. It was noon and I was engaged in writing some letters, when one of the enthusiasts of our town rushed into the room somewhat abruptly and exclaimed, "What do you say to visiting Webb's Hill this afternoon? This morning's shower has washed the cube pyrites out and I know we'll find a lot."

I am always prepared to join a collecting trip and when the clock struck one my mineralogical friend was on hand and found me ready to go.

Webb's Hill is about three or four miles from the city of York, Pa. The shortest way to reach the road at the foot of the hill is to take the Northern Central R.R. till you reach Grantley, a small station south of York. Here we began scaling the hill, which, thanks to the morning's shower, was not such a wearisome job as it might have been. The road was not muddy, as the soil on this hill is very sandy and the water is carried right off. With the mercury at the nineties this would have been a very disagreeable trip, but as it was we could not have chosen a better time. Up the hill we trudged. We were fast nearing the top. Way down below us we saw the beautiful town of York, with the smoke curling from the chimneys of its many shops. We could not help but pause in admiration of the scene below us. The muddy creek, made so by the morning's rain, creeping away to the hills beyond the city where it was lost to view, the railroad with its serpentine windings through the valley below, the whole set off with forest-covered hills in the distance made indeed a pretty picture. But we did not come to admire the lovely scenery, so we turned our backs upon it and were again toiling up the hill.

There were now indications of the mineral that we came after, and our eyes were kept busy watching for the cubes which grew more plentiful and larger in size as we neared the top of the hill. Reaching the top we found them most plentiful, right along the public road, which is travelled each day. The rain had washed many of them out. We gathered several pounds, some of them imbedded in talc. As it was growing late we were compelled to leave, although we would have liked to spent some time longer, gathering the cubes, the supply of which seemed to be inexhaustible.

LIMESTONE.

By Franklin C. Johnsón.

With the exception of quartz, limestone furnishes more specimens to the collector than any other mineral.

Limestone is useful for building purposes, and when the carbonic acid is expelled by heat, quick-lime is produced.

This family comprises one-seventh of the earth's crust. It is a compound of lime and carbonic acid. It embraces all shades from white and cream color to a dense black. It can be known by its softness and by its effervescing with an acid.

Calcite, which is the scientific name for all limestones, crystallizes in the hexagonal system. The crystals are usually in hexagonal prisms or rhombohedrons. When the crystals are transparent they are termed Iceland spar.

Chalk is a porous, uncompacted variety of limestone.

Calcareous Tufa is formed by deposition from water charged with carbonate of lime.

Stalactites and Stalagmites are produced like tufa, from calcareous waters.

Oolite is a limestone consisting of many small round grains, looking like the spaun of a fish.

Marl consists of a mixture of clay and carbonate of lime. It is valuable as manure.

Magnesian Limestone, or dolomite, contains magnesia, and is harder than limestone.

Marble is crystallized limestone.

The finest statuary marble comes from the Italian quarry at Carrara, and from the Island of Paros.

NEW YORK MINERALOGICAL CLUB.

THE fourteenth meeting of this Club was held at the Natural History Hall of the College of New York, 23d St. and Lexington Ave., on the invitation of Gen. Webb and Prof. Stratford, on Tuesday, Oct. 25th, at 8 o'clock. Rev. J. Selden Spencer was elected Chairman for the evening. Twenty-six members were present.

As the subject of the meeting was Inclusions in Quartz, over two hundred fine specimens were brought by the different members to illustrate the subject.

Mr. Kunz also exhibited the largest Beryl Crystal ever found in New York City, measuring 4 inches in diameter, also the largest Epidote crystals and first piece of Columbite ever found in New York City, having been discovered by Mr. William Niven a week previous to the meeting.

Mr. Braun read a paper on the subject of the evening and illustrated it with the specimens he had brought with him.

Mr. Kunz gave us some interesting facts about the formation of Quartz and illustrated it with his specimens.

The subject of next meeting will be Native Gold, and will be illustrated with specimens brought by the members.

Two new members were admitted and three proposed for membership.

After partaking of refreshments the meeting adjourned.

◆

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